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New, Major Evidence That Fracking Harms Human Health

A child born very close to a well is likely to be smaller and less healthy than a child born farther away.

A fracking well in Colorado Jim Urquhart / Reuters

Hydraulic fracturing, or fracking, may pose a significant—but very local—harm to human health, a new study finds.

Mothers who live very close to a fracking well are more likely to give birth to a less healthy child with a low birth weight—and low birth weight can lead to poorer health throughout a person's life.

The research, published Wednesday in *Science Advances*, is the largest study ever conducted on fracking's health effects.

> "I think this is the most convincing evidence that fracking has a causal effect on local residents," said Janet Currie, an economist at Princeton University and one of the authors of the study.

The researchers took the birth records for every child born in Pennsylvania from 2004 to 2013—more than 1.1 million infants in total—and looked at the mother's proximity to a fracking site, using the state of Pennsylvania's public inventory of fracking-well locations. They used private state records that showed the mother's address, allowing them to pinpoint where every infant spent its nine months in utero.

They found significant, but very local, consequences. Infants born to mothers who lived within two miles of a fracking well are less healthy and more underweight than babies born to mothers who lived even a little further away. Babies born to mothers who lived between three and 15 miles from a fracking well—that is, still close enough to benefit financially from the wells—resembled infants born throughout the rest of the state.

While birth weight may seem like just a number, it can affect the path of someone's life. Children with a low birth weight have been found to have lower test scores, lower lifetime earnings, and higher rates of reliance on welfare programs throughout their lives. In a previous study, a different team of researchers examined twins in Norway whose birth weight diverged by 10 percent or more.

The lighter twin was 1 percent less likely to graduate from high school and earned 1 percent less than their sibling through their life.

> "Hydraulic fracturing has widely dispersed benefits—we are all paying lower natural-gas bills for heating, we're all paying lower electricity prices, we're all paying less for cheaper gasoline at the pump. And even if health was all that you care about, we're all benefitting from decreased air pollution that's widely dispersed, because coal plants are closing," said Michael Greenstone, a professor of economics at the University of Chicago and another authors of the paper.

But all those benefits, he said, were borne by the local communities that lived extremely close to hydraulic fracturing wells.

> "There's this interesting trade off between the greater good and what are the costs and benefits for local communities," he told me.

Oil and gas lobbying groups rushed to criticize the study.

> "This report highlights a legitimate health issue across America that has nothing to do with natural gas and oil operations. It fails to consider important factors like family history, parental health, lifestyle habits, and other environmental factors and ignores the body of scientific research that has gone into child mortality and birthweight," said Reid Porter, a spokesman for the American Petroleum Institute, a trade organization that represents the oil and gas industry.

In the fracking study, researchers tried to separate the costs of fracking and socioeconomic status and parental health in several ways. First, they compared baby birthweight near fracking wells to those babies immediately around them, which they believe accounts for the wealth of various communities.

Second, they found that the connection held for siblings who were or were not exposed to a fracking well.

> "We follow the same mother over time and ask whether on average, children born after fracking starts have worse outcomes than their siblings born before fracking starts," Currie told me. "In this case, since we follow the same woman over time, we are controlling for her underlying characteristics."

Babies who gestated near a well had a reliably lower birth weight than their siblings who were not exposed to the well.

The researchers don't yet know why this link between fracking and low birth weight exists, though they suggest that air pollution could be a possible contributor. The process of fracking may release chemicals into the air, for one, but many wells also run multiple diesel engines at once, and they can be a hub of local activity, with trucks regularly commuting to the sites.

While environmental activists and some researchers have proposed that fracking chemicals may leak into groundwater, most studies have failed to find lasting and widespread water pollution near wells.

The birth-weight study seems to suggest that air, not water, pollution may instead be the threat that fracking sites pose to human health.

Greenstone believes the next step for this research is to figure out exactly what is driving the babies' low birth weight.

> "Is it the trucks? Is it the diesel generators?" he said. "If you knew the channel, you might be able to devise a light-touch regulatory approach."

But he and Currie also believe more research is needed to figure out how fracking affects people outside the womb and later in their life. Such connections will be harder to distill, but may become easier as this kind of broad, data-based approach to environmental economics becomes more widespread.